DIALYSIS, RENAL TRANSPLANTATION, CLINICAL ENGINEERING, AND DIET THERAPY FOR DIABETES MELLITUS AND CHRONIC KIDNEY DISEASE

2019

JAC-DSC
Japanese Assistance Council of establishing Dialysis Specialists system in Cambodia

~ intensive seminar ~
August 22 ~ 23, 2019
Phnom Penh, Cambodia
Dialysis, Renal Transplantation, Clinical Engineering, and Diet Therapy for Diabetes Mellitus and Chronic Kidney Disease

~ intensive seminar ~

August 22 ~ 23, 2019
Phnom Penh, Cambodia

Japanese Assistance Council of Establishing Dialysis Specialists System in Cambodia (JAC-DSC)
International University (IU), Phnom Penh, Cambodia
Supported by
Cambodian Association of Nephrology (CAN)
NGO Ubiquitous Blood Purification International (NGO UBPI)
Japanese Society for Technology of Blood Purification (JSTB)
Dear Participants.

Congratulations for “the intensive seminar of Dialysis, Renal Transplantation, Clinical Engineering, and Diet Therapy for Diabetes Mellitus and Chronic Kidney Disease in Cambodia 2019”. This seminar will be informed the important message for ESRD/CKD field in Cambodia and South East Asian countries.

The number of patients being treated for ESRD globally was estimated to be 3,200,000 at the end of 2013 and, with a 6% growth rate, continues to increase at a significantly higher rate than the world population. In particular, the remarkable increasing rate was shown in Asian countries. However, the access to treatment is still limited in many developing countries and a number of patients with terminal renal failure do not receive treatment. In order to save these patients, it is necessary to enhance the dialysis system, the educated staff and association of each countries.

Japanese Assistance Council of Establishing Dialysis Specialist System in Cambodia (JAC-DSC) was organized the several educational programs from 2015. Moreover, the Cambodia Association of Nephrology was stated at 2016 and approval by International Society of Nephrology (ISN). This is a great opportunity recognized worldwide for the Cambodian Nephrology Society. I hope that everyone will grow in the renal area with this educational program. We will expect to be built the cooperation between JAC-DSC and Cambodian Nephrology Team and younger generation.
Natsumi Abe, C.E., M.T.
Director, Reiseikai Medical Corporation, Tokyo, Japan
Chief Clinical Engineer, Reiseikai Medical Corporation, Tokyo, Japan
Medical Technologist

Akira Kato, C.E.
Clinical Engineer, Eijin Clinic and Kurenai Hospital Dialysis Center, Hatsuoka, Japan

Takayuki Abe, C.E.
Tokyo Women’s Medical University, Department of Clinical Engineering, Tokyo, Japan

Yukie Kitajima, R.D., Ph.D.
Associate Professor, Department of Medical Nutrition, Tokyo Women’s Medical University, Setagaya, Japan
Dietitian of Reiseikai medical corporation shinagawa garden clinic, Tokyo, Japan

Satoshi Ebihara, R.N., C.E., B.N.
Chief Registered Nurse, Reiseikai Medical Corporation, Tokyo, Japan
Clinical Engineer, Bachelor of Nursing Science

Norio Hanafusa, M.D., Ph.D.
Associate Professor, Department of Blood Purification, Tokyo Women’s Medical University, Tokyo, Japan
Vice-Chair, Committee of Renal Data Registry, Japanese Society for Dialysis Therapy, Tokyo, Japan

Masaru Imai, C.E.
Manager Department of Research and Development, Education Advisor Department of Clinical Engineering, Reiseikai Medical Corporation, Tokyo, Japan

Toshihide Naganuma, M.D., Ph.D.
Lecturer, Department of Urology, Osaka City University Graduate School of Medicine, Osaka, Japan
Guest Professor, International University, Phnom Penh, Cambodia

Minoru Ito, M.D., Ph.D.
Assistant Director, Department of Nephrology and Dialysis Center, Tsuchi Hospital, Yamagata, Japan
Guest Professor, International University, Phnom Penh, Cambodia

Masaru Imai, C.E.
Manager Department of Research and Development, Education Advisor Department of Clinical Engineering, Reiseikai Medical Corporation, Tokyo, Japan

Toshihide Naganuma, M.D., Ph.D.
Lecturer, Department of Urology, Osaka City University Graduate School of Medicine, Osaka, Japan
Guest Professor, International University, Phnom Penh, Cambodia

Hyojo Nakamura, M.D., Ph.D.
Chief Director of Department of Hemodialysis and Apheresis of Arisawa General Hospital, Osaka, Japan

Ayumi Takizawa, C.E., M.T.
Tokyo Women’s Medical University, Department of Clinical Engineering, Tokyo, Japan
Medical Technologist

Ken Sakurai, M.D., Ph.D.
Director, Hashimoto Clinic, Kanagawa, Japan

Kenji Sakurai, M.D., Ph.D.
Associate Professor, Department of Urology, Osaka City University Graduate School of Medicine, Osaka, Japan
Director, Hashimoto Clinic, Kanagawa, Japan

Thim Pichthida, M.D.
Medical Doctor, Angkor Hospital for Children, Siem Reap, Cambodia
Member, CAN

Ken Tsuchiya, M.D., Ph.D.
Department of Blood Purification, Tokyo Women’s Medical University, Shinjuku, Tokyo, Japan
Professor, Department of Blood Purification, Tokyo Women’s Medical University, Tokyo, Japan

Phon Elin, M.D.
Associate Professor, Blood Purification Department, Osaka Institute of Technology, Osaka, Japan
Resident, Department of Pediatric, Senri Kyle Memorial Hospital, Kampot, Cambodia

Junji Uchida, M.D., Ph.D.
Associate Professor, Department of Urology, Osaka City University Graduate School of Medicine, Osaka, Japan
Guest Professor, International University, Phnom Penh, Cambodia

Kazuyuki Yamaguchi, M.D.
Postgraduate student and Medical Doctor, Osaka City University Graduate School of Medicine, Department of Urology, Osaka, Japan

Ryoichi Sakiyama, Ph.D.
Associate Professor, Bioartificial Organs Lab, Department of Biomedical Engineering, Osaka Institute of Technology, Osaka, Japan

Atsushi Ueda, M.D., Ph.D.
Associate Professor, University of Tsukuba Hospital, Hitachi Social Cooperation Education Research Center
Manager, Nephrology, Hitachi General Hospital
Manager, Kidney & Lifestyle-related Diseases Center, Hitachi General Hospital

Junji Uchida, M.D., Ph.D.
Associate Professor, Department of Urology, Osaka City University Graduate School of Medicine, Osaka, Japan
Guest Professor, International University, Phnom Penh, Cambodia

Shunji Nishide, M.D.
Postgraduate student and Medical Doctor, Osaka City University Graduate School of Medicine, Department of Urology

Phon Elin, M.D.
Associate Professor, Biomedical Engineering, Osaka Institute of Technology, Osaka, Japan
Resident, Department of Pediatric, Senri Kyle Memorial Hospital, Kampot, Cambodia

Ken Tsuchiya, M.D., Ph.D.
Department of Blood Purification, Tokyo Women’s Medical University, Shinjuku, Tokyo, Japan
Professor, Department of Blood Purification, Tokyo Women’s Medical University, Tokyo, Japan

Norio Hanafusa, M.D., Ph.D.
Associate Professor, Department of Blood Purification, Tokyo Women’s Medical University, Tokyo, Japan
Vice-Chair, Committee of Renal Data Registry, Japanese Society for Dialysis Therapy, Tokyo, Japan

Ayumi Takizawa, C.E., M.T.
Tokyo Women’s Medical University, Department of Clinical Engineering, Tokyo, Japan
Medical Technologist

Kenji Sakurai, M.D., Ph.D.
Director, Hashimoto Clinic, Kanagawa, Japan

Ayumi Takizawa, C.E., M.T.
Tokyo Women’s Medical University, Department of Clinical Engineering, Tokyo, Japan
Medical Technologist

Ema Maeda
Department of Urology, Nephrology and Dermatology Maeda clinic, Nagasaki
**The intensive seminar of Dialysis, Renal Transplantation, Clinical Engineering, and Diet Therapy for Diabetes Mellitus and Chronic Kidney Disease in Cambodia 2019**

**Preliminary Program**

**Venue:** International University, No. 35-41, Street 582, Boeung Kak II, Khan Toulkoki, Phnom Penh, Cambodia

**Master of Ceremonies:** Phisith Vouch, M.P.A.

### Day-1: August 22, Thu., 2019

#### Session 1

**Chairpersons:** Sosy Kamol, M.D. and Minoru Ito, M.D., Ph.D.

- **10:20-10:40** [01] Introduction of the Seminar and Overview of Kidney Disease by Haruki Wakai, M.D.
- **10:40-11:00** [02] Basics of Hemodialysis and Hemodiafiltration by Kenichi Kobuku, Ph.D.
- **11:00-11:20** [03] Dialysis History by Hideki Kawaniishi, M.D., Ph.D.
- **11:20-11:40** [04] The Current Status of ESRD and Nephrology in Cambodia by Thin Fichhida, M.D.
- **11:40-12:10** [05] Membranes and Kinetics of Dialysis Therapy by Akihiro C. Yamashita, Ph.D.
- **12:10-12:40** [06] Biocompatibility of Dialysis Membrane from the Clinical Aspect by Kenji Sakurai, M.D., Ph.D.

#### Session 2

**Chairpersons:** Chan Sovandy, M.D. and Kenji Sakurai, M.D., Ph.D.

- **14:00-14:15** [07] Quality Management of Dialysis Fluid by Ayumi Takizawa, C.E., M.T.
- **14:15-14:20** [08] Result of the Water Quality Testing in Cambodia by Satoshi Ishihara, R.N., C.E., B.N.
- **14:20-14:45** [09] Clearance (HD, HDF) and Internal Filtration of HD by Ryoichi Sakiyama, Ph.D.
- **14:45-15:00** [10] The Practical Working Flow in Dialysis Room by Natsumi Abe, C.E., M.T.

#### Session 3

**Chairpersons:** Nov Tam, M.D. and Ken Tsuchiya, M.D., Ph.D.

- **16:10-16:30** [13] Safety Management in Dialysis Room by Yoshitaka Kurihara, C.E., Ph.D.
- **16:30-17:00** [14] Clinical Benefits of On-line Hemodiafiltration by Kenji Sakurai, M.D., Ph.D.
- **17:00-17:30** [15] Long-Hour Hemodialysis, Long-Hour Hemodiafiltration by Kanonori Maeda, M.D., Ph.D.
- **17:30-17:45** [16] Home Hemodialysis by Haruki Wakai, M.D.
- **17:45-18:15** [17] Peritoneal Dialysis as Renal Replacement Therapy by Hideki Kawaniishi, M.D., Ph.D.

### Day-2: August 23, Fri., 2019

**Session 4**

**Chairpersons:** Chin Sammang, M.D., IMPH, and Atsushi Ueda, M.D., Ph.D.

- **8:00-8:30** [18] Diagnosis and treatment of CKD –Usefulness of early diagnosis by kidney(Renal) biopsy– by Atsushi Ueda, M.D., Ph.D.
- **8:30-8:50** [19] Acute Kidney Insufficiency by Hideki Kawaniishi, M.D., Ph.D.
- **8:50-9:20** [20] CKD and Dialysis Treatment in Children by Hyogo Nakamura, M.D., Ph.D.
- **9:20-9:50** [21] Kidney Transplantation as Renal Replacement Therapy by Junji Uchida, M.D., Ph.D.
- **9:50-10:20** [22] CKD-MBD by Ken Tsuchiya, M.D., Ph.D.
- **10:20-10:35** [23] Cerebral Vascular Disease by Toshiohida Naganuma, M.D., Ph.D.
- **10:35-10:50** [24] Infection of Dialysis Patients by Toshiohida Naganuma, M.D., Ph.D.

#### Session 5

**Chairpersons:** Tim Sovannbophea, M.D. and Junji Uchida, M.D., Ph.D.

- **11:25-11:40** [26] Standard Procedure for Arteriovenous Fistula and Superficialization by Toshiohida Naganuma, M.D., Ph.D.
- **11:55-12:10** [28] Peripheral Artery Disease of Dialysis Patients by Toshiohida Naganuma, M.D., Ph.D.
- **12:10-12:40** [29] Management Against Renal Anemia by Norio Hanafusa, M.D., Ph.D.

#### Session 6

**Chairpersons:** Kim Sam Oudum, M.D. and Norio Hanafusa, M.D., Ph.D.

- **14:30-14:50** [31] Nutrition in CKD Patients by Minoru Ito, M.D., Ph.D.
- **14:50-15:10** [32] Diet Therapy for Dialysis Patients by Yuki Kitajima, R.D., Ph.D.
- **15:10-15:20** [33] Pre-Dialysis Diabetic CKD Diet Therapy by Toru Hyodo, M.D., Ph.D.
- **15:20-15:40** [34] Basic Carbohydrate Counting for CKD Diabetic Patients by Phon Elin, M.D.
- **15:40-16:00** [35] What is Advanced Carbohydrate Counting? by Phon Elin, M.D.

#### Day-2: Closing Ceremony

- **17:00-17:20** Break

#### Examination

**Organizer:** Kenichi Kobuku, Ph.D. and Haruki Wakihi, M.D.

- **18:00-18:23** Examination notes

#### Closing Ceremony

- **18:00-18:20** Awarding Ceremony
- **18:20-18:30** Closing Remarks by Akihiro Yamashita, Ph.D., Adviser of JAC-DSC and IU Guest Prof. Hideki Kawaniishi, M.D., Ph.D., President of JAC-DSC

#### Presentation of the Certification of Attendance

- **18:30-18:40** Presentation of the Certification of Attendance
Although it is not a universal index to evaluate the treatment, represented by KT/V, we should learn how we compute the value and how we utilize the value for prescription.

Since there are many kinds of dialysis membrane, we should first learn their physicochemical properties including solute removal performance as well as biocompatibility. Since dialysis dose is usually represented by KTV, we should learn how we compute the value and how we utilize the value for prescription, although it is not a universal index to evaluate the treatment.

Hemodialysis (HD) is a therapy which replace some kidney functions by the use of advanced membrane separation technique in an extracorporeal system to remove metabolic wastes such as urea, creatinine, uric acid and excess fluid in the body and to control ion balance and pH of the blood. Hemodiafiltration (HDF) is also a therapy which replace some kidney functions and characterized by enhanced solute removal of larger molecules by convection (filtration) compared to HD. This lecture will cover the basics of HD and HDF including their principles, techniques and procedures.

Hemodialysis (HD), acting as an artificial kidney, is one of the treatment options for end stage renal disease (ESRD). In Cambodia, the burdens of ESRD and hemodialysis have been increasing yet there is no national registry currently. Cambodia has its own obstacles to promote a better hemodialysis. In this session, the history, present condition, and issues of hemodialysis and nephrology in Cambodia will be discussed.

The kidney is a vital organ that performs many important functions to support life. Decreased kidney function can lead to various symptoms such as reduced urinary volume, edema, anemia, loss of appetite, and general malaise, which gradually affect other organs. In this lecture, I will cover the symptoms and pathology of renal diseases and provide an overview of representative renal diseases such as chronic glomerulonephritis, diabetic nephropathy, nephrosclerosis, chronic pyelonephritis, cystic renal disease, and nephrotic syndrome.

Modern dialysis therapy started in the 1960s. Since then, several new developments in dialysis machines and systems have occurred and have made dialysis a life-saving treatment for patients with CKD.

Hemodialysis (HD) acting as an artificial kidney, is one of the treatment options for end stage renal disease (ESRD). In Cambodia, the burdens of ESRD and hemodialysis have been increasing yet there is no national registry currently. Cambodia has its own obstacles to promote a better hemodialysis. In this session, the history, present condition, and issues of hemodialysis and nephrology in Cambodia will be discussed.

The most important device of the dialysis therapy is a dialyzer, among which membrane is the crucial part of the device. Since there are many kinds of dialysis membrane, we should first learn their physicochemical properties including solute removal performance as well as biocompatibility. Since dialysis dose is usually represented by KTV, we should learn how we compute the value and how we utilize the value for prescription, although it is not a universal index to evaluate the treatment.

Hemodiafiltration (HDF) is also a therapy which replace some kidney functions and characterized by enhanced solute removal of larger molecules by convection (filtration) compared to HD. This lecture will cover the basics of HD and HDF including their principles, techniques and procedures.

Hemodialysis (HD) is a therapy which replaces some kidney functions by the use of advanced membrane separation technique in an extracorporeal system to remove metabolic wastes such as urea, creatinine, uric acid and excess fluid in the body and to control ion balance and pH of the blood. Hemodiafiltration (HDF) is also a therapy which replaces some kidney functions and characterized by enhanced solute removal of larger molecules by convection (filtration) compared to HD. This lecture will cover the basics of HD and HDF including their principles, techniques and procedures.

Since there are many kinds of dialysis membranes, we should first learn their physicochemical properties including solute removal performance as well as biocompatibility. Since dialysis dose is usually represented by KTV, we should learn how we compute the value and how we utilize the value for prescription, although it is not a universal index to evaluate the treatment.

Modern dialysis therapy started in the 1960s. Since then, several new developments in dialysis machines and systems have occurred and have made dialysis a life-saving treatment for patients with CKD.

Hemodialysis (HD) acting as an artificial kidney, is one of the treatment options for end stage renal disease (ESRD). In Cambodia, the burdens of ESRD and hemodialysis have been increasing yet there is no national registry currently. Cambodia has its own obstacles to promote a better hemodialysis. In this session, the history, present condition, and issues of hemodialysis and nephrology in Cambodia will be discussed.

The kidney is a vital organ that performs many important functions to support life. Decreased kidney function can lead to various symptoms such as reduced urinary volume, edema, anemia, loss of appetite, and general malaise, which gradually affect other organs. In this lecture, I will cover the symptoms and pathology of renal diseases and provide an overview of representative renal diseases such as chronic glomerulonephritis, diabetic nephropathy, nephrosclerosis, chronic pyelonephritis, cystic renal disease, and nephrotic syndrome.

Hemodialysis (HD) is a therapy which replace some kidney functions by the use of advanced membrane separation technique in an extracorporeal system to remove metabolic wastes such as urea, creatinine, uric acid and excess fluid in the body and to control ion balance and pH of the blood. Hemodiafiltration (HDF) is also a therapy which replace some kidney functions and characterized by enhanced solute removal of larger molecules by convection (filtration) compared to HD. This lecture will cover the basics of HD and HDF including their principles, techniques and procedures.

The most important device of the dialysis therapy is a dialyzer, among which membrane is the crucial part of the device. Since there are many kinds of dialysis membrane, we should first learn their physicochemical properties including solute removal performance as well as biocompatibility. Since dialysis dose is usually represented by KTV, we should learn how we compute the value and how we utilize the value for prescription, although it is not a universal index to evaluate the treatment.

Hemodialysis (HD), acting as an artificial kidney, is one of the treatment options for end stage renal disease (ESRD). In Cambodia, the burdens of ESRD and hemodialysis have been increasing yet there is no national registry currently. Cambodia has its own obstacles to promote a better hemodialysis. In this session, the history, present condition, and issues of hemodialysis and nephrology in Cambodia will be discussed.

Hemodialysis (HD) is a therapy which replace some kidney functions by the use of advanced membrane separation technique in an extracorporeal system to remove metabolic wastes such as urea, creatinine, uric acid and excess fluid in the body and to control ion balance and pH of the blood. Hemodiafiltration (HDF) is also a therapy which replace some kidney functions and characterized by enhanced solute removal of larger molecules by convection (filtration) compared to HD. This lecture will cover the basics of HD and HDF including their principles, techniques and procedures.

The most important device of the dialysis therapy is a dialyzer, among which membrane is the crucial part of the device. Since there are many kinds of dialysis membrane, we should first learn their physicochemical properties including solute removal performance as well as biocompatibility. Since dialysis dose is usually represented by KTV, we should learn how we compute the value and how we utilize the value for prescription, although it is not a universal index to evaluate the treatment.

Hemodialysis (HD), acting as an artificial kidney, is one of the treatment options for end stage renal disease (ESRD). In Cambodia, the burdens of ESRD and hemodialysis have been increasing yet there is no national registry currently. Cambodia has its own obstacles to promote a better hemodialysis. In this session, the history, present condition, and issues of hemodialysis and nephrology in Cambodia will be discussed.

Hemodiafiltration (HDF) is also a therapy which replace some kidney functions and characterized by enhanced solute removal of larger molecules by convection (filtration) compared to HD. This lecture will cover the basics of HD and HDF including their principles, techniques and procedures.

Hemodialysis (HD) is a therapy which replace some kidney functions by the use of advanced membrane separation technique in an extracorporeal system to remove metabolic wastes such as urea, creatinine, uric acid and excess fluid in the body and to control ion balance and pH of the blood. Hemodiafiltration (HDF) is also a therapy which replace some kidney functions and characterized by enhanced solute removal of larger molecules by convection (filtration) compared to HD. This lecture will cover the basics of HD and HDF including their principles, techniques and procedures.

The most important device of the dialysis therapy is a dialyzer, among which membrane is the crucial part of the device. Since there are many kinds of dialysis membrane, we should first learn their physicochemical properties including solute removal performance as well as biocompatibility. Since dialysis dose is usually represented by KTV, we should learn how we compute the value and how we utilize the value for prescription, although it is not a universal index to evaluate the treatment.

Hemodialysis (HD), acting as an artificial kidney, is one of the treatment options for end stage renal disease (ESRD). In Cambodia, the burdens of ESRD and hemodialysis have been increasing yet there is no national registry currently. Cambodia has its own obstacles to promote a better hemodialysis. In this session, the history, present condition, and issues of hemodialysis and nephrology in Cambodia will be discussed.

Hemodialysis (HD) is a therapy which replace some kidney functions by the use of advanced membrane separation technique in an extracorporeal system to remove metabolic wastes such as urea, creatinine, uric acid and excess fluid in the body and to control ion balance and pH of the blood. Hemodiafiltration (HDF) is also a therapy which replace some kidney functions and characterized by enhanced solute removal of larger molecules by convection (filtration) compared to HD. This lecture will cover the basics of HD and HDF including their principles, techniques and procedures.

The most important device of the dialysis therapy is a dialyzer, among which membrane is the crucial part of the device. Since there are many kinds of dialysis membrane, we should first learn their physicochemical properties including solute removal performance as well as biocompatibility. Since dialysis dose is usually represented by KTV, we should learn how we compute the value and how we utilize the value for prescription, although it is not a universal index to evaluate the treatment.

Hemodialysis (HD), acting as an artificial kidney, is one of the treatment options for end stage renal disease (ESRD). In Cambodia, the burdens of ESRD and hemodialysis have been increasing yet there is no national registry currently. Cambodia has its own obstacles to promote a better hemodialysis. In this session, the history, present condition, and issues of hemodialysis and nephrology in Cambodia will be discussed.

Hemodialysis (HD) is a therapy which replace some kidney functions by the use of advanced membrane separation technique in an extracorporeal system to remove metabolic wastes such as urea, creatinine, uric acid and excess fluid in the body and to control ion balance and pH of the blood. Hemodiafiltration (HDF) is also a therapy which replace some kidney functions and characterized by enhanced solute removal of larger molecules by convection (filtration) compared to HD. This lecture will cover the basics of HD and HDF including their principles, techniques and procedures.

The most important device of the dialysis therapy is a dialyzer, among which membrane is the crucial part of the device. Since there are many kinds of dialysis membrane, we should first learn their physicochemical properties including solute removal performance as well as biocompatibility. Since dialysis dose is usually represented by KTV, we should learn how we compute the value and how we utilize the value for prescription, although it is not a universal index to evaluate the treatment.

Hemodialysis (HD), acting as an artificial kidney, is one of the treatment options for end stage renal disease (ESRD). In Cambodia, the burdens of ESRD and hemodialysis have been increasing yet there is no national registry currently. Cambodia has its own obstacles to promote a better hemodialysis. In this session, the history, present condition, and issues of hemodialysis and nephrology in Cambodia will be discussed.

Hemodialysis (HD) is a therapy which replace some kidney functions by the use of advanced membrane separation technique in an extracorporeal system to remove metabolic wastes such as urea, creatinine, uric acid and excess fluid in the body and to control ion balance and pH of the blood. Hemodiafiltration (HDF) is also a therapy which replace some kidney functions and characterized by enhanced solute removal of larger molecules by convection (filtration) compared to HD. This lecture will cover the basics of HD and HDF including their principles, techniques and procedures.
Blood Volume Monitoring during Dialysis Therapy

Satoshi Ebihara, R.N., C.E., B.N.

For dialysis treatment, high quality dialysis fluid is required. And, original water (tap water or water from wells) is important to make good dialysis fluid. This time, we tested the water quality of original water in Phnom Penh and several rural areas. Each result of water quality was almost good. However, there are some problems in details. This result indicates that we need to perform water quality test of original water in the area when we make dialysis fluid and it is necessary to take action for improvement when any problems are detected.

Clearance (HD, HDF) and Internal Filtration of HD

Ryoichi Sakiyama, Ph.D.

1) The clearance is introduced as an index representing the function of the living kidney and is used as a performance evaluation of the artificial kidney. The clearance is affected by various conditions when the clearance measured.
2) Internal filtration is filtration caused by pressure loss in the dialyzer in hemodialysis. Purification of the dialysate is very important since the dialysate flows into the living body side by internal filtration.

The Practical Working Flow in Dialysis Room

Natsumi Abe, C.E., M.T. / Masaru Imai, C.E.

Dialysis therapy requires the cooperation of many medical professionals. Nurses and clinical engineers perform most of the daily practical work. In this lecture, the practical working flow at a standard dialysis room in Japan will be explained through the use of video footage. This virtual experience will allow you to familiarize yourself with dialysis treatment.

Blood Pressure Control and Water and Sodium Restriction in Dialysis Patients

Akira Kato, C.E.

Dialysis patients cannot excrete urine if the residual renal function is completely diminished. Therefore, the amount of drinking water is equal to all weight gain. Since the weight gain is a factor related to life prognosis, it must be properly managed. For this reason, we must know the relationship between the weight gain and salt intake. The salt intake between the inter-dialysis can be calculated by using the following formula based on the serum salt concentration in HD patients (approximately 140 mEq/L): The increase in the body weight (Kg) x 140 x molecular weight of salt (58.5)/1,000 = The increase in the body weight (Kg) x approximately 8 g. In other words, the formula means the consumption of salt at approximately 8 g per 1.0 kg weight gain (water retention of 1.0 L).

Please introduce this formula to patients and utilize it.

Blood Volume Monitoring during Dialysis Therapy

Takayuki Abe, C.E.

Extracorporeal blood circulation and water removal during dialysis therapy greatly affects the hemodynamics of the patient during hemodialysis treatment. Hemodynamics is important for the safety of the treatment and the monitoring of hemodynamics by a blood volume measurement is effective to know the patient’s condition during hemodialysis. In this lecture, the principle and clinical usefulness of blood volume monitoring during treatment will be discussed.

Safety Management in Dialysis Room

Yoshifusa Kurihara, C.E., Ph.D. / Kenichi Kokubo, Ph.D.

Safety management in dialysis room is important to prevent mistakes in clinical situation which may result in serious medical accidents. In order to confirm the safety, several concept applied in dialysis device, such as such as interlock, foolproof and fail safe. In addition, staff always use check sheets as a tool of safety management. In this lecture, the concept and methodology of safety management used in the dialysis room will be explained.

Clinical Benefits of On-line Hemodiafiltration

Kanenori Maeda, M.D., Ph.D.

The number of dialysis patients in Japan was 334,505 at the end of 2017. Of these, 21.1% were receiving on-line hemodiafiltration (HDF), and 84.4% of the on-line HDF were performed with pre-dilution mode. The number of HDF patients is increasing year by year. In Europe, post-dilution HDF has been widely used. The main purpose of HDF is to remove middle- and large-molecular uremic toxins effectively in order to prevent and treat complications of dialysis patients. Therefore, it is very important to set the appropriate conditions of HDF. When HDF is performed under suitable conditions, good therapeutic effects can be obtained against various complications (i.e. Dialysis Amyloidosis, Restless Legs Syndrome, Pruritus). However if the condition for performing HDF are inappropriate, the removal efficiency of HDF is almost the same as the performance of hemodialysis with a supper high-flux dialyzer and there is no positive impact on patients conditions. Therefore, it is very important to evaluate the removal efficiency of HDF. 62-Microglobulin (MG) (MW:11.8 kDa) is an important marker of dialysis removal efficiency. However, 62-MG is a little small as a marker for evaluation of the removal efficiency of HDF. α1-MG (MW: 33 kDa), which is removed by convection, should be used as a marker to assess the removal efficiency of HDF. The α1-MG reduction rate of 35% or more is the target number in HDF. I will give a presentation about clinical benefits of on-line HDF on dialysis-related symptoms and the difference in biocompatibility between pre-dilution on-line HDF and post-dilution on-line HDF.

Long-Hour Hemodialysis, Long-Hour Hemodiafiltration

Kanenori Maeda, M.D., Ph.D.

Background

Conventional hemodialysis (HD) / Hemodiafiltration (HDF) around the world may be four hours a session, 3 times a week. Long-hour HD/HDF around the world may be 8 hours a session, 3 times a week. Long-hour HD/HDF in Japan are 6 hours or more a session, 3 times a week.

How long hours are conventional HD/HDF in Cambodia ?

The functions of the kidneys are “filtration”, “re-absorption” and “endocrine.” The functions of HD/HDF are “diffusion”, “convection” and “adsorption.” HD/HDF are not as adequate as healthy kidneys. Our healthy kidneys work 24 hours a day. On the other side, conventional HD/HDF are performed only 12 hours a week.

So, intermittent HD/HDF are insufficient renal replacement therapies !!!

Contents

I will show data from the Japanese Society for Dialysis Therapy Renal Data Registry (JRDR). A huge observational cross-sectional study from JRDR was conducted to determine the relationship between the treatment time and some objectives. In this study, as the treatment time becomes longer per one session, Kt/V increases, the control of serum phosphate levels and nPCR (normalized protein catabolic rate) were improving. As the treatment time becomes longer, the serum albumin levels, blood hemoglobin levels and the reduction rate of serum 62MG levels increased.

Additionally, I will introduce data from DOPPS that is the Dialysis Outcomes and Practice Pattern Study from 11 countries and areas. DOPPS is a prospective cohort study of in-center hemodialysis patients. In this study, when treatment time is 30 minutes longer per one session, we recognized the improvement in all-cause mortality, the rate of sudden death, risk of any hospitalization, risk of cardiovascular hospitalization and the risk of hospitalization due to chronic heart failure or fluid overload.

Conclusion

Long-hour HD and long-hour HDF are very effective methods for end-stage renal failure patients.
Acute kidney injury (AKI) is an abrupt loss of kidney function that develops within 7 days. Generally it occurs because of damage to the kidney tissue caused by decreased kidney blood flow from any cause, exposure to substances harmful to the kidney, an inflammatory process in the kidney, or an obstruction of the urinary tract. In this lecture, we will discuss the mechanism and management of AKI.
In general, dialysis is known to impair immune function and increase the susceptibility to infection. Dialysis has also been reported to reduce cell-mediated and humoral immunity. Uremic substances, malnutrition, acidosis, and renal anemia have been identified as potential contributing factors to immunosuppression. According to a nationwide statistical survey by the Japanese Society for Dialysis Therapy (as of December 31, 2013), infectious disease is the second-leading cause of death in dialysis patients (20.8%). Thus, infection is a serious concern in management of dialysis patients. In this lecture, the characteristics and management of infectious diseases in dialysis patients will be explained.

**Vascular access** will be distributed after my lecture. The video of typical arteriovenous fistula (AVF) and superficialization creation procedure at our hospital. The video of vascular access will be distributed after my lecture.

---

**[24] Infection of Dialysis Patients**

Toshihide Naganuma, M.D., Ph.D.

In general, dialysis is known to impair immune function and increase the susceptibility to infection. Dialysis has also been reported to reduce cell-mediated and humoral immunity. Uremic substances, malnutrition, acidosis, and renal anemia have been identified as potential contributing factors to immunosuppression. According to a nationwide statistical survey by the Japanese Society for Dialysis Therapy (as of December 31, 2013), infectious disease is the second-leading cause of death in dialysis patients (20.8%). Thus, infection is a serious concern in management of dialysis patients. In this lecture, the characteristics and management of infectious diseases in dialysis patients will be explained.

**[25] Malignant Tumors in Hemodialysis Patients**

Shunji Nishide, M.D.

**Introduction**

The overall incidence of cancer is reported to be higher in patients with end-stage renal disease (ESRD) than in the general population. Dialysis patients, for example, were more likely to develop cancer of the bladder (standardized incidence ratio), kidney, liver, thyroid, tongue, and cervix, as well as multiple myeloma and non-Hodgkin lymphoma.

**Risk factor**

Acquired renal cystic disease increases the risk of renal cell carcinoma. Prolonged analgesic abuse is a risk factor for transitional cell carcinoma of the bladder, ureter, and renal pelvis and for renal cell carcinoma.

Some reports suggest that reduced immune function among chronic dialysis patients contributes to the enhanced incidence of malignancy.

**Cancer Screening**

Mammography, Papanicolaou tests, Flexible sigmoidoscopy, and Serum prostate-specific antigen (PSA) levels etc. are recommended.

**Treatment of cancer in Dialysis Patients**

Once diagnosed, cancer in a dialysis patient is generally treated as in the nondialysis patient with appropriate consideration of the renal clearance, dosing, and dialyzability of chemotherapeutic agents.

**Future story –Tumor immunity–**

Recently, development of tumor immunology has been remarkable, including PD-1 antibody. Macrophage are very important immune cell for tumor immunity. Macrophage-abundant tumors are highly malignant and are the cause of poor prognosis and therapeutic resistance. In this lecture, I show that the prolyl hydroxylase (PHD) inhibitor FG-4592 inhibits tumor growth of macrophage-abundant tumors and prolongs mouse survival. FG not only normalizes tumor vessels and improves tumor oxygenation but also directly affects macrophages and activates phagocytosis through the PHD-hypoxia-inducible factor (HIF) axis. Remarkably, FG can promote phagocytic ability of tumor-infiltrating macrophages, leading to tumor growth inhibition. I suggest that the PHD inhibitor can promote the anti-tumor potential of macrophages to improve cancer therapy.

**[26] Standard Procedure for Arteriovenous Fistula and Superficialization**

Toshihide Naganuma, M.D., Ph.D.

Vascular access is an essential component of hemodialysis treatment. I would like show you a video of the typical arteriovenous fistula (AVF) and superficialization creation procedure at our hospital. The video of vascular access will be distributed after my lecture.

**[27] Daily Management of Vascular Access**

Kazuyuki Yamaguchi, M.D.

Vascular access (VA) is created in the patient’s body to allow large volumes of blood to circulate between the patient and dialysis machine. VA is an essential component in dialysis therapy. Therefore, daily management of VA is very important, due to its frequent use and changing the state of VA stenosis and the state of puncture and hemostasis at the previous treatment. Regarding other problems, VA recirculation is that the dialyzed blood returned from the V side of the dialysis circuit is not returned to the heart but removed again from the A side and re-dialyzed. In this lecture, we will discuss about VA management including VA puncture method, monitoring and surveillance of VA stenosis and VA recirculation.

**[28] Peripheral Artery Disease of Dialysis Patients**

Toshihide Naganuma, M.D., Ph.D.

Diabetes is a well-known risk factor for peripheral arterial disease (PAD) of the legs. CKD has also been reported to be an independent risk factor for PAD of the legs. It is known that PAD incidence is high among dialysis patients with stage 5D CKD and is associated with very poor prognosis. In the Dialysis Outcomes and Practice Patterns study (DOPPS), the worldwide and Japanese prevalence rates of PAD in dialysis patients are reported to be 25.3% and 11.5%, respectively. In this lecture, PAD treatment will be explained from a perspective of blood purification therapy including LDL apheresis.

**[29] Management Against Renal Anemia**

Norio Hanafusa, M.D., Ph.D.

The chronic kidney disease (CKD) patients, including on hemodialysis, often experience anemia due to the decreased activity of erythropoietin because this hormone is produced in the kidneys. Although anemia is associated with worse outcomes, the normal hemoglobin levels have been shown not to improve outcomes or even to be associated with worse outcomes as well. Therefore, many guidelines recommend the target hemoglobin levels to be lower in CKD patients than the general population. Many hemodialysis patients also experience iron deficiency. The strategies against renal anemia include the administration of erythropoiesis-stimulating agents (ESAs) and/or iron. Transferrin saturation (TSAT) calculated from serum iron levels and total iron binding capacity (TIBC), and serum ferritin are two markers to be investigated in dialysis patients as iron indices. The target levels of these indices are quite different between the Japanese Society for Dialysis Therapy (JSDT) guideline and other guidelines. In Japan, conservative use of iron is recommended, the upper limit of serum ferritin allowed is 300ng/ml while the Kidney Disease Improving Global Outcomes (KDIGO) guideline allows up to 500ng/ml. ESA hyporesponsiveness can occur in many conditions such as inflammation or wasting. This condition, which requires a high dose of ESA but cannot attain adequate hemoglobin levels, is shown to be associated with poor clinical outcomes of the patients. In this lecture, these topics will be discussed.
Nutritional problems in CKD patients are complicated, and its causes are multifactorial. Malnutrition, inflammation, and atherosclerosis affect the nutrition of CKD patients strongly. In this lecture, we will focus on the special features of the nutrition of CKD and discuss the management of malnutrition for the patients.

**Diet Therapy for Dialysis Patients**

Yukie Kitajima, R.D., Ph.D.

The purpose of diet therapy is to avoid malnutrition and prevent the progression of various hemodialysis related complications. The basics of the dialysis diet are as follows:

1. Control of salt and water intake
2. Appropriated energy intake
3. Control of potassium intake
4. Appropriated protein intake
5. Control of phosphorus intake

It is most important for dialysis patients to restrict salt. This lecture will focus on ways to control water intake, ensure adequate energy and potassium intake in dialysis patients. Increased concentration of potassium in the blood can strain on the heart. This lecture will cover foods high in potassium and cooking methods to reduce potassium content with specific examples. In addition, I will lecture how to intake protein and phosphorus. Hyperphosphatemia is a risk factor for cardiovascular disease and is associated with the development of secondary hyperparathyroidism and ectopic calcification. Potassium and Phosphorus is a nutrient contained in many foods. It is important for CKD patients to monitor their daily dietary phosphorus intake. Dietary habit in Japan is different from that in Cambodia. Together let’s think about what foods and dishes in Cambodia have high and low contents of potassium and phosphorus.

**Pre-Dialysis Diabetic CKD Diet Therapy**

Toru Hyodo, M.D., Ph.D.

Diabetes is the main cause of dialysis induction in many countries. There are no dietitians who deal with CKD patients in Cambodia. Nephrologists must know how to treat with such diabetic and non-diabetic CKD patients by diet therapy. In this lecture the basic concept of diet therapy for these patients is explained.

**Basic Carbohydrate Counting for CKD Diabetic Patients**

Phon Elin, M.D.

Diabetes is the main cause leading CKD and dialysis induction in many countries as well as in Cambodia. Blood sugar control is important in diabetes patients, as it helps to prevent the complications. Basic carbohydrate counting is the basic meal planning option for managing blood glucose levels. Recently, carbohydrate counting has been shown to be a powerful method to control blood sugar in diabetic dialysis patients. In this lecture, the basic carbohydrate counting will be described as the diet therapy for CKD diabetic patients.

**What is Advanced Carbohydrate Counting?**

Phon Elin, M.D.

According to the fact that only carbohydrate raises blood sugar, not fat, not protein, the advanced carbohydrate counting is practiced for insulin therapy patients. Every diabetic patient learns the insulin dose for 1 Carbohydrate Unit (10 g of carbohydrate) to keep good blood sugar level. Every patient injects insulin according to the amount of carbohydrate which he or she eats. However, they have already learned the basic carbohydrate counting. As the result, they inject almost the same dose of insulin at every meal. Only when the patients face the situations that they eat more or less carbohydrate than as usual, they change the insulin dose. They can get the flexibility of eating by the advanced carbohydrate counting.
Introduction of devices related to dialysis

Kaname Sadahiro
Yuki Tanaka
Nipro Corporation

Nipro Corporation Sponsor Speech 1
We introduce Nipro Corporation Company Profile and Nipro’s corporate policy Nipro Medical Training Facility “IMEP”.
We will give an overview of the high quality dialysis products manufactured by Nipro.

Nipro Corporation Sponsor Speech 2
We will introduce Nipro’s new dialysis machines, portable echo devices and endotoxin testing machines.

Intercultural “media” for all people concerned in healthcare and for all children

Publication of books and magazines
Planning, creation, and renewal of websites.
Translation services between Khmer, English, and Japanese languages.
Support in planning and organizing various academic meetings and training events.
Import, export and sale of healthcare items.

18/F Canadia Tower, No.315, Ang Doung St, Corner Monivong Blvd, Phnom Penh, Cambodia
http://www.reiseikai-media.org/index-e.html
Privilege for participants

• JAC-DSC will issue a certificate of seminar completion to participants with an attendance rate of 70% or higher who achieve the specified score or higher on the final test.

• An English textbook on dialysis etc. will be given to participants with an attendance rate of 70% or higher who rank among the top 4th - 6th based on the final test score.

• Three particularly excellent participants who satisfy all of the following criteria will be invited to attend a training course (7 to 10 days) in Japan:
  1. A participant with an attendance rate of 70% or higher and an excellent final test score.
  2. A participant who is highly motivated and qualified to become a dialysis healthcare professional.
  3. A participant with a certain level or higher English skills.
  4. A participant who is courteous and follows the rules.
  5. A participant who is in good health and without infectious disease.
  6. A participant who wishes to participate in the training in Japan and can obtain family consent.
  7. A participant who can obtain a passport.
  8. A participant who is less than 40 years old.
  9. A participant who have never been to Japan by support of Japanese organization (JAC-DSC, JSTB, JSST, etc.).

* Selection will be made by the JAC-DSC. Objections to the selection results will not be allowed.
* The training will take place in near Tokyo and Yokohama, Japan, in February or October 2020. The participants will receive practical training at several medical institutions and universities. They can join a tour of Tokyo or Osaka as an extracurricular activity.
* The JAC-DSC, JSTB, cooperative organizations, cooperative medical institutes, or cooperative companies will pay for the following training expenses: airfare, hotel, travel insurance, transfer fee, Cambodia International Airport tax, and reference materials.

How to apply

Please make contact with “International University, Cambodia” directly or e-mail your information to info@ubpi.org
Please write, your name, age, female/male, e-mail address, phone number, occupation, institute and department that you belong to (university, school, hospital, clinic, corporation, etc.), in your e-mail.
Your e-mail will be forwarded to both of JAC-DSC staff and IU staff automatically.
*Participants need to pay $10 USD to cover venue preparation costs.
*All Japanese chairpersons and lecturers are volunteer.